

Phone Number: **Read Troubleshooting Section First!**
 Email: info@gemremotes.com WWW.GEMREMOTES.COM

**Read All Directions Prior to Installation! Installation should be done
 By a qualified technician and be wired to the NEC codes.**

**Customer user instructions are printed on the yellow face card inside the GEM box make sure they read them
 before use! Use of other wiring directions could result in damage to your GEM unit and/or the motor.**

We have 27 years of experience. We recommend that you read and use the Step by Step Wiring Procedures before starting the installation. It could save you time and money.

Step by Step Wiring Procedures:

To ensure proper installation of your GEM Controller, use our directions in lieu of all others.

Tools: Philip's #2 and a flat head screwdriver, wire strippers, volt meter and wire cutters and wire nuts.

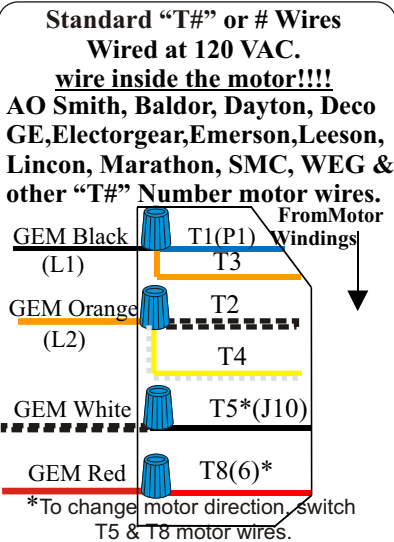
- Turn off power at the circuit breaker.** Overload protection is not provided inside the GEM unit. Use properly sized circuit breaker and wire size based on horsepower of motors. See a wire chart below. **Check with a volt meter before wiring that you have 0 volts.**
- Remove face card screws, open slowly (be careful of the tail on the back side) if necessary unplug tail by pulling on black plastic.
- Cut off drum(hand) switches, GEM units are not designed to be used in conjunction with switches. Strip main feed and motor wires inside the GEM unit. If your drum switch had a corded GFI, you can use one as the main feed wire(120VAC only). **We recommend that GEM units be wired at 240VAC see Figure 1A (page 2), if 120vac AO Smith motors then see drawing figure 1B (page 4).**
- Main feed black goes to the Lug on bottom left side of the contactor marked L1. **For 120VAC units you must hook up your Neutral(white) to L2 and also attach the GEM supplied white wire with a yellow tip to L2. If a GFI unit main feed wires will be pre wired. Only hook up your main feed wires to GEM supplied wires. GFI units wired at 120VAC the GEM White and Red go to your white. Do not tie motor wires directly to any main feed wires! Wiring 240VAC the neutral goes to the neutral bar on the right side of the box. If a GFI unit, do not hook up the main feed white wires to the Neutral bar. If you have neutral then do not rewire transformer. Do not attache the GEM supplied white wire to L2 if wired at 240VAC.** If your unit is a special order 240VAC only then you will not have white wires or a neutral bar. If the unit is wired for 240VAC then your motors must be rewired for 240VAC.
- Connect Motor #1 wires to Lugs on bottom right side of the contactor as labeled: **Motor #1 Red(top), M#1 Black(middle), M#1 Orange(bottom). Motor #1 wires are on the same side as the limit switch (if auto-stop). When wiring at 120 VAC Connect Motor white wires to GEM motor neutral bar (White Motor wires not used for 240VAC).... Do not hook motor wire to main feed white wire!** Motor #2 wires if a 2-motor system attach, wires color to color inside the GEM box(off the level switch) using wire nuts. **If your lift has one motor and you have a GR2 don't use Motor #2 wires, cap them off.**
- Connect green or bare wires to Green wire on the transformer. Green or bare wires must only be used as a ground. **It is unsafe to use a ground as a neutral.**

Recommended Wire Size for Installation of your GEM Controller-1 Phase,75C Copper Wire															
# of Motors	Motor HP	120 Volt AC Main Feed							240 Volt AC Main Feed						
		Amps to run	Breaker Size	50 Feet	100 Feet	200 Feet	300 Feet	400 Feet	Amps to run	Breaker Size	50 Feet	100 Feet	200 Feet	300 Feet	400 Feet
1	1/2	8.8	10 Amps	12	10	6	4	4	4.4	5 Amps	14	14	12	10	10
1	3/4	10.8	15	12	8	6	4	3	5.4	10	14	14	12	12	10
1	1	12.8	15	10	8	6	4	3	6.4	10	14	14	12	12	10
1	1 1/2	17.0	20	10	6	4	2	1	8.5	10	14	14	10	10	8
2	1/2	17.6	20	10	6	4	2	1	8.8	10	12	12	10	8	6
2	3/4	21.6	25	8	6	3	1	----	10.8	15	12	12	10	8	6
2	1	25.6	30	8	4	2	1	----	12.8	15	12	10	8	6	4
2	1 1/2	34.0	35	6	4	1	2/0	----	17.0	20	12	10	8	4	2
4	1/2	----	----	----	----	----	----	----	17.6	20	12	10	6	4	4
4	3/4	----	----	----	----	----	----	----	21.3	25	12	8	6	4	3
4	1	----	----	----	----	----	----	----	26.0	30	10	8	4	3	2
4	1 1/2	----	----	----	----	----	----	----	36	35	10	6	4	2	1
4	2	----	----	----	----	----	----	----	44.8	45	8	6	3	1	1/0

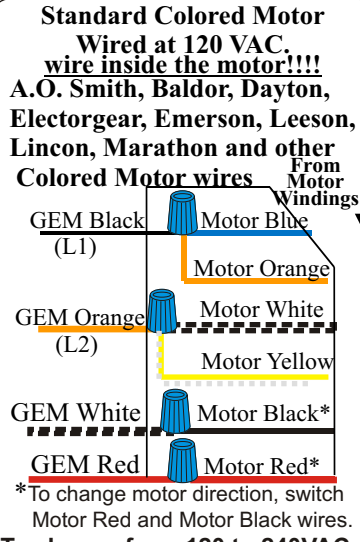
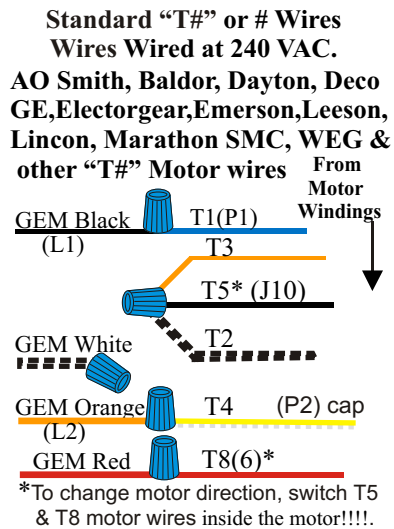
Breakers size is our recommendation. Please use motor label for proper size and code compliance.

- Open motor covers and configure motor wires as shown below. **You may have to move wires inside the motor even though the hand switches worked(AO Smith motors)!** If your motor has terminals inside, check for that motor diagram on the next page otherwise use the **Standard T Numbered Wired motor** drawing or the **Standard color motor-wired drawing** below. **AO Smith 120/240 vac wired with terminals is below on the right, AO Smith 120 vac only motors are on the next page. Inspect wires inside each motor to ensure proper wire connections. Failure to do so could damage your motors. Not wired color to color inside the motor!** To reverse motor starting direction, swap wires **inside the motor!** Some motors have circuit protection and output wires from these might have different color wires. Also, some manufacturers pre-wire their motors with wires that don't match GEM wires. Some substitutions are blue for a green(ground), and yellow for a white wire.
- If part number on the left side of the door has an "A" then your unit is an Auto-Stop. Your unit will not work without the limit switch wires hooked up. **Check that your lift stops in both the up and the down direction! An Auto-Stop unit must have GEM limit switches hooked up. Failure to do so could result in damage to your lift and/or the boat and is against code and not insured.** See the auto-stop LED on the top of the unit. When lit the unit is in an auto-run mode, if flashing fast the lift is at an up limit and if slow then the lift is at the down limit. To toggle in and out of Auto-Stop(run) mode press an auto-stop button.
- Attach the face card electronic tail to the receiver board, pin #1 goes on the left, replace face card screws.
- To level the lift, turn off the Auto mode(if equipped). Hold the level switch in the off position. This will turn off power to motor #2. While holding it down raise or lower one side. **Do not let go of the level switch until the motor is stopped.**
- Turn off the unit when not in use. Make sure the owner reads operating instructions printed on the yellow face card. Test the GFI** (if equipped) once every month and/or before each use. GEM's GFI Needs 120VAC to work. The emergency override holes bypasses GFI protection, and if the GFI is buzzing stop or the GFI will be damaged! GEM units have a three second delay before switching directions. This ensures that the motors go in the right direction.
- A replacement transmitter (#7240) or a spare can be bought online at www.gemremotes.com. Loss of range or unit hiccups check battery, 2: 3 volts (Cr2032). Old, 6230 transmitters will not work with this unit.

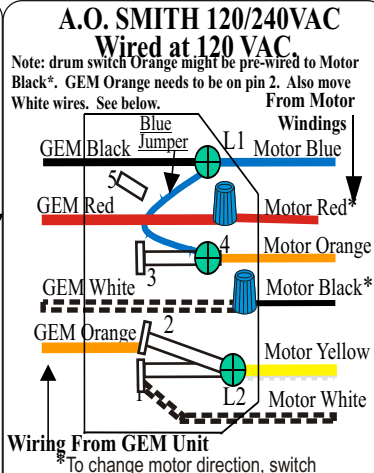
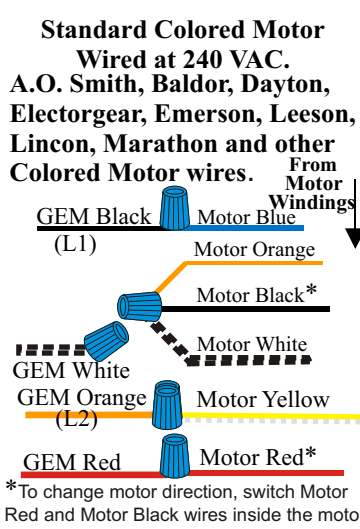
Note: drum switch wire Orange might be pre-wired to Motor Blk(T5)*. GEM Orange needs to be attached to Pin2 or Motor Yel/T4



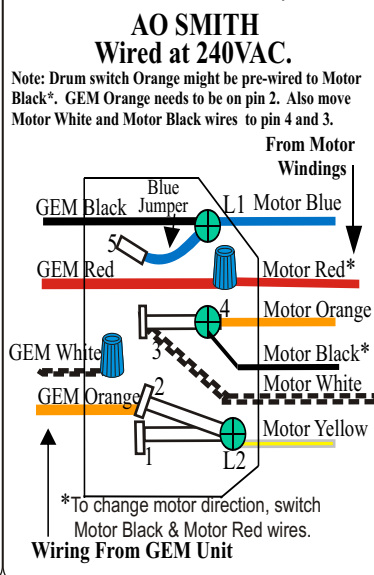
To change from 120 to 240VAC:
1. Cap GEM White wire (not used).
2. Attach 3 motor wires together T3, T5* and T2.
3. FYI: GEM Blk to T1(P1), GEM Orange to T4, GEM Red to T8(6)*.



To change from 120 to 240VAC:
1. Cap GEM White wire (not used).
2. Attach 3 motor wires together M Orange, M Blk* and M White.
3. FYI: GEM Black to Motor Blue, GEM Orange to Motor Yellow, GEM Red to Motor Red*.

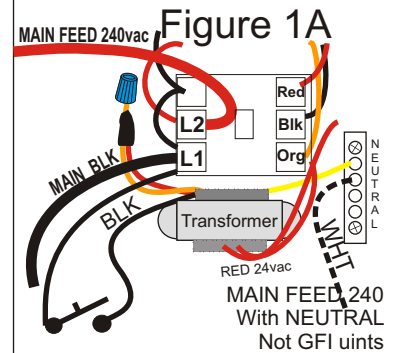


To change from 120 to 240VAC:
1. Cap GEM White wire (not used).
2. Place Motor Black on pin 4.
3. Move Motor Blue jumper from pin 4 to pin 5.
4. **GEM Orange is on pin 2!!!!!!**
5. Move Motor White from pin 1 to 3.

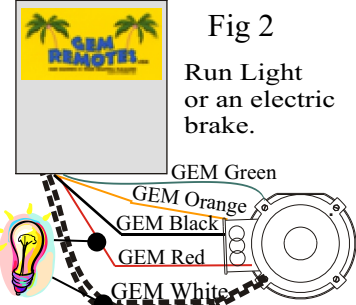


240VAC WIRING (not GFI units)

Main Feed Connections
Hook your Main feed Neutral wire to motor white neutral bar. If you don't ave a Neutral (120vac) rewire transformer see page 4

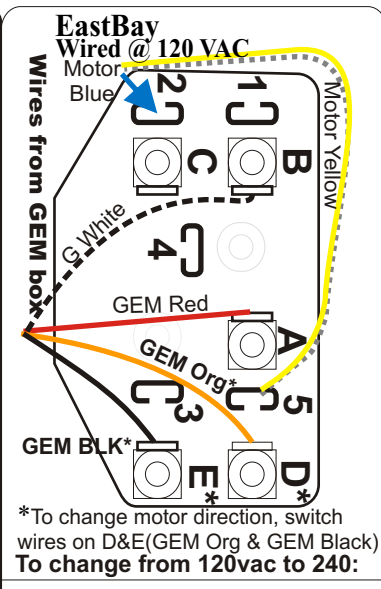
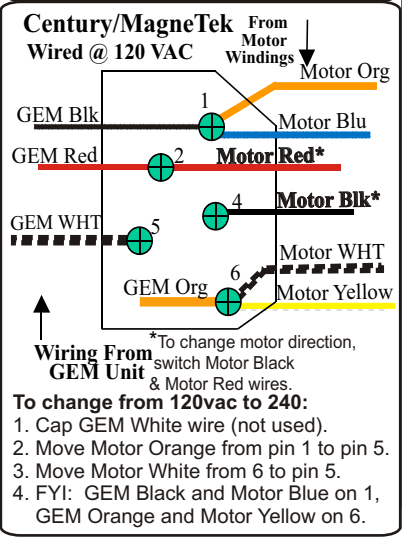
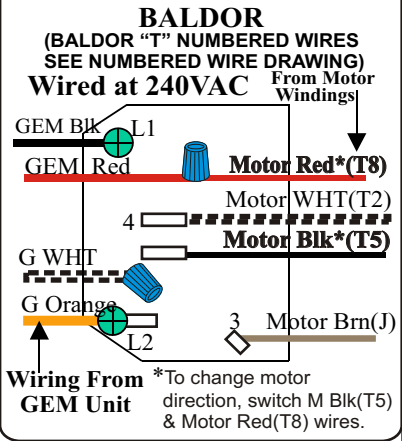
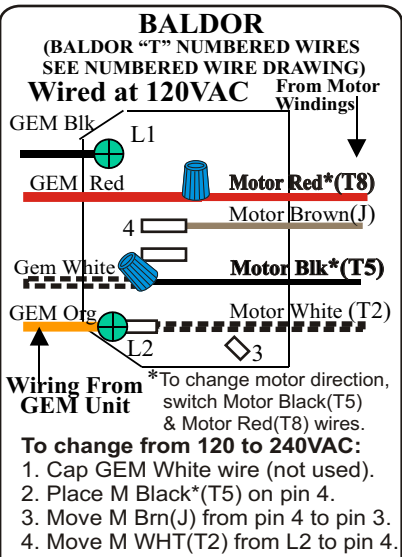


Run Light or Brake



Attach the run light to the GEM Red & GEM White for 120VAC or 240 VAC systems that has a 120VAC neutral.

To run a 120VAC brake attach wires to GEM Orange and GEM Black when main feed is at 120VAC. If 240VAC brake is used, use GEM Orange and Blk. If you have 240VAC system and you only have a 120VAC brake then you must use GEM White & GEM Red. (The GEM white wire will be used at 240VAC).



For East bay 240vac wiring use "230VAC Remote" not 230VAC switch" diagram on the motor.

For help with eastbay motors call the number on the motor.

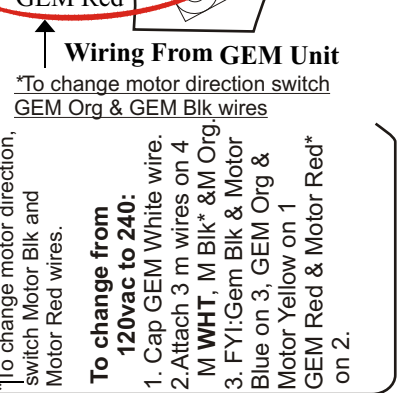
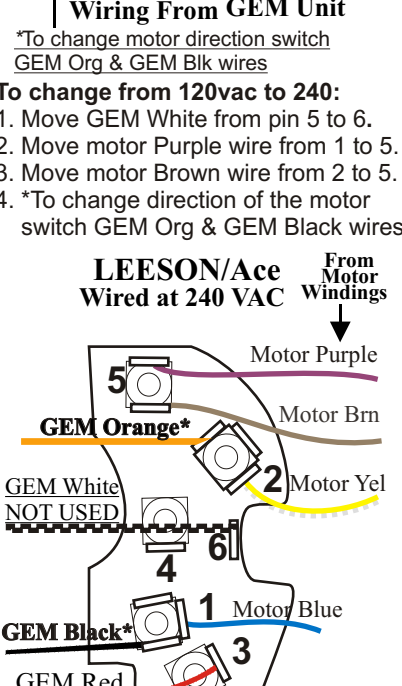
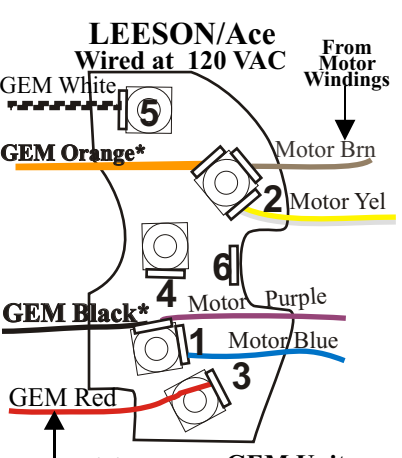
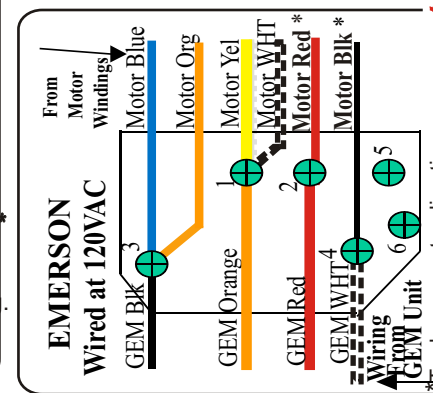
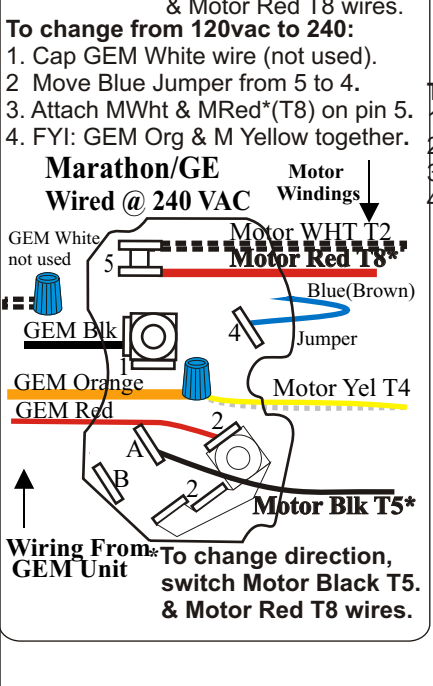
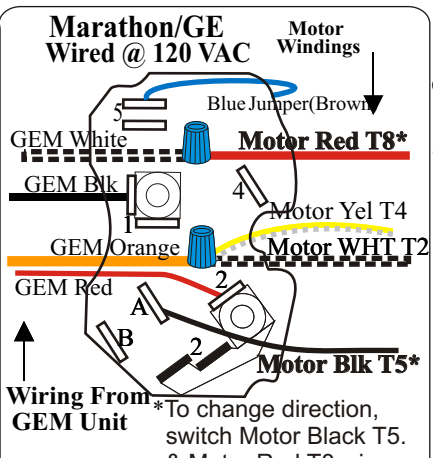
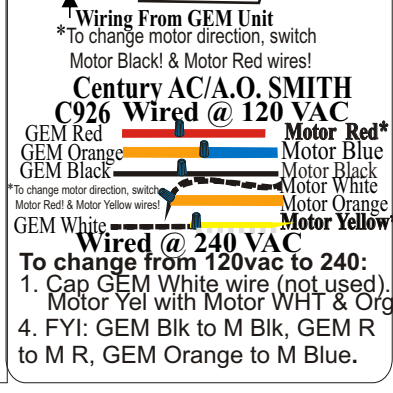
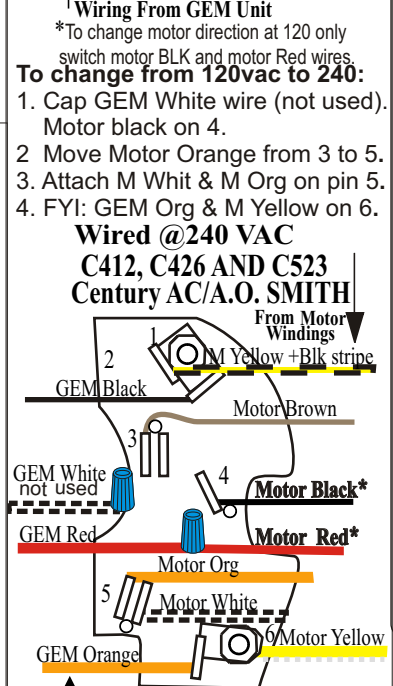
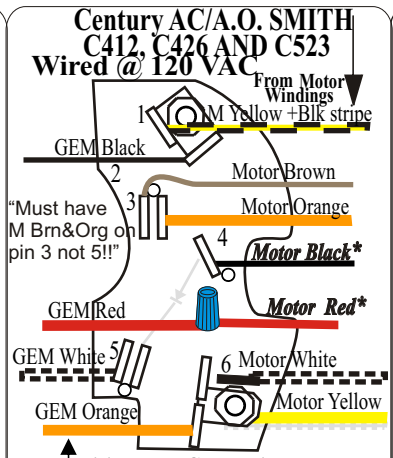


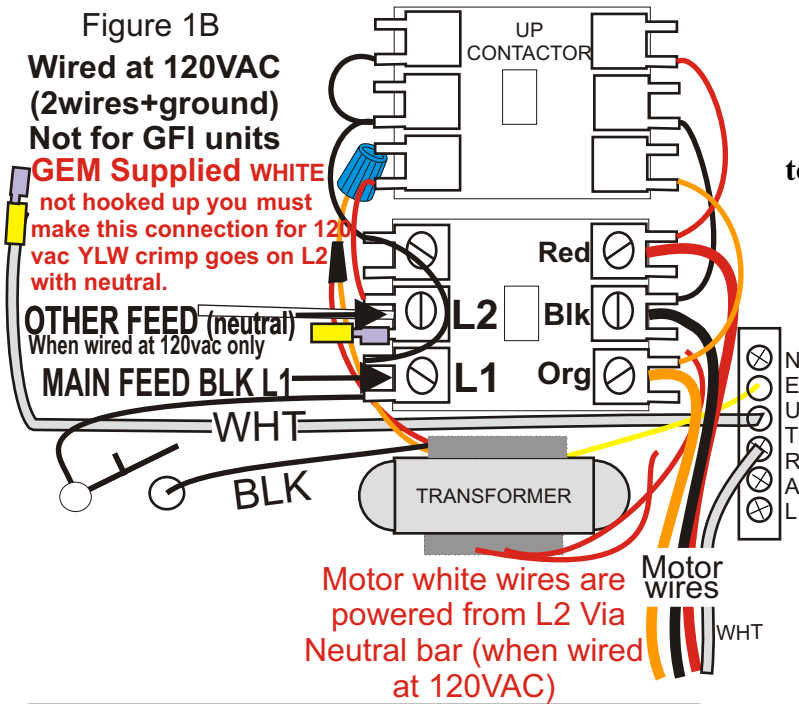
Figure 1B

**Wired at 120VAC
(2wires+ground)
Not for GFI units**

GEM Supplied WHITE
not hooked up you must
make this connection for 120
vac YLW crimp goes on L2
with neutral.

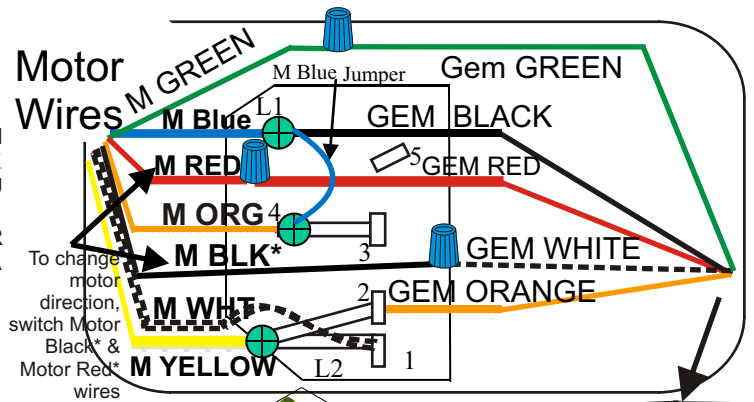
OTHER FEED (neutral)
When wired at 120vac only

MAIN FEED BLK L1



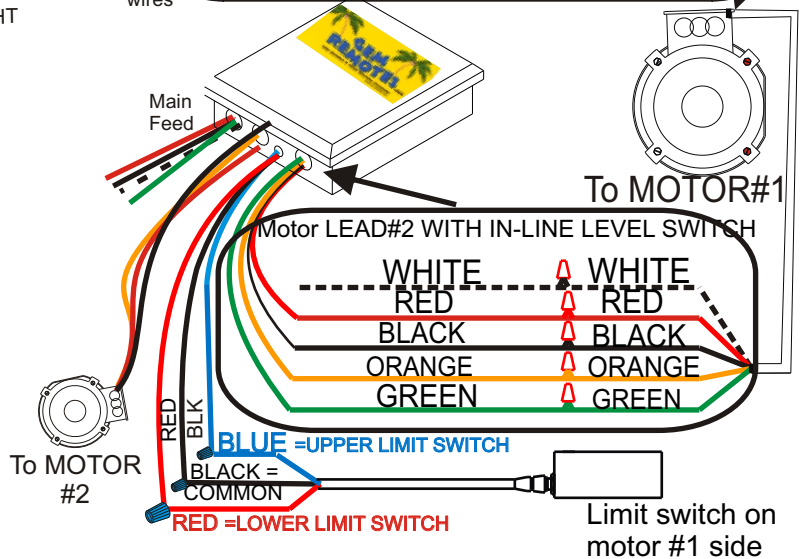
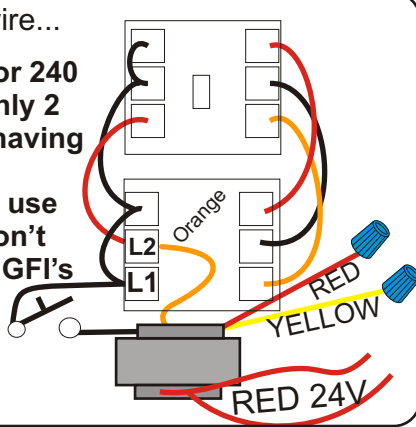
Motor white wires are
powered from L2 Via
Neutral bar (when wired
at 120VAC)

This exploded view is inside the inspection panel of an
A.O. SMITH motor wired at 120VAC
to a GEM GR2A. **GEM ORANGE WIRE IS ON PIN 2!!!**
See previous pages for more motor wire diagrams.



240 VAC only rewire...

**Rewire transformer for 240
Volt hook up using only 2
wires + ground (Not having
a neutral 120vac)
see #13 below. Only use
this diagram if you don't
have a neutral, GEM GFI's
units needs 120VAC
to work.**



TROUBLESHOOTING:

1. If your remote works but your membrane switch buttons don't work you need to plug in the M/S tail to the receiver board.
 2. You must **cut off drum switches**: They worked, but the GEM unit only works in one direction. You need to rewire inside motors GEM Orange wire!!
 3. **1 or two motors turn in the wrong direction: Switch motor wires**, wires inside the motor, check motor name plate for reversing directions.
 4. **Chatter or grumble in the contactor**: Check for low voltage, when system is running. Check wire size vs. run length all the way from the motors to the breaker at the house. Example 2 3/4hp motors wired at 120vac 180' would need a #3 wire to the GEM unit. The motor wire size would come from the #1 motor chart. Use total distance from the motor to the breaker. 1 3/4hp motor wired at 120vac 200' would be = # 6
 5. **Motor not working**: Color-to-Color wiring inside the motor is incorrect. You must use GEM's motor wire diagrams. **A.O. Smith motors, move GEM Orange wire to pin 2!!** GEM units works with 120/240VAC 1 phase, cap. start, induction run motors. Three phase motors require a special unit please call. 1 1/2 horsepower motors and larger can have a capacitor start and a cap. run. The run cap. might not reverse or the run cap. can explode. It must be removed. This will increase the run amps that the motor will draw by three amps. Eastbay motors, 2 cap systems require no modifications.
 6. Transmitter **does not work** a 3-second delay when switching direction. Check that LED on transmitter lights and check that the learn button LED lights when receiving from the transmitter. Relearn the transmitter, press the learn button 1 time and then push the Stop button the Learn LED should flash.
 7. **Short range or lift hiccups**: If the red LED on the transmitter flickers, **replace the batteries 2: 3Volt CR2032**. Do not change the length of the antenna wire on the receiver board this will not help the range. You should have line of sight for the unit to have up to 300-foot range.
 8. If the GEM unit is dead check that the LED flash on powered up. If no flash then check your power you can also press in the middle of top contactor if the lift runs, you have main power but your 24 VAC transformer is not working (check neutral). **Auto-Stop units must be hooked up to a limit switch**. A fast flash on the LEDs means that the up limit is reached a slow flash is for the down limit. If the led are flashing fast then slow then both limits are open check to see if it hooked up or wire damage. **It is against code and not covered by insurance to be used without a GEM limit switch**.
 10. **Clearing the memory**: Press and hold the Learn/Clear button for 7 seconds (LED will light) when the LED flashes stop pressing and memory will be cleared. Test to see if it works. To learn, press learn once, then press the Stop button on the transmitter. The Learn LED will flash 2 times.
 11. **TROUBLESHOOTING: GFI** needs a neutral. **GFI will not reset if it sees a fault or it does not have 120VAC**. Disconnect all motor wires, check to see if the GFI resets, press up and down note contactor pulling in, then hook up 1motor at a time to find the fault. Problems are normally the far motors.
 12. **TROUBLESHOOTING: Wiring at 110-120VAC: Motor Hum: 120VAC wiring connect the neutral bar/motor white wire to L2**. See figure 1B. Use Gems supplied white wire and attach to left side of bottom contactor marked L2. Over sizing the circuit breaker can damage your lift, motors and/or the boat. Use the correct size circuit breaker and wire size. Use a wire chart on page 1 and size breakers based on the total horse power of motors.
 13. **TROUBLESHOOTING: Wiring at 220VAC-240VAC 50 to 60hz:** 4 motor or special ordered **240V only units** do not have a Neutral bar unless a GFI unit. If ordered 240 only, then you only need 2 wires +ground main feed. If you don't have 3+G then you will need to rewire the system for 240VAC only (2+Ground). **A GFI unit needs 120 to work so don't rewire transformer**. Read the label, on top of the transformer BLK-ORG = 240 VAC. Remove yellow wire from neutral bar and cap it off. Find the Orange transformer wire, it should be hiding around the base of the contactor on the left it has a red wire taped to it. Attach the Orange transformer wire to L2. The red wire taped to this wire is used for 208 vac connections don't use.
 14. **TROUBLESHOOTING: Wiring at 208VAC:** Rewire the transformer. Read label on transformer BLK-RED =208 Remove yellow wire from neutral bar and tape it off. Find Red transformer wire, it should be hiding around the base of the contactor on the left it is taped to an Orange wire. Attach Red transformer wire to L2. The Orange wire that it was taped to is for 240 connections. GFI units need a 120vac to work.
- Need more help?** Call 239-642-0873 M-F 8:30-4:30 EST. The web page also has more information for after hours help.